



Professional Licensing Boards

Georgia Construction Industry Licensing Board

*Division of Low Voltage
Contractors*

Licensure Examinations

Candidate Information Bulletin

Examination Development and Testing Unit

Copyright © 2005. This information has been prepared by Applied Measurement Professionals, Inc. (AMP) and the Examination Development and Testing Unit (EDTU) of the Professional Licensing Boards for the benefit of licensure candidates. All candidates are provided this information free of charge. Commercial reproduction for a fee is prohibited.

The Professional Licensing Boards do not discriminate among candidates on the basis of age, gender, race, religion or national origin. The Professional Licensing Boards also do not discriminate among mentally or physically challenged candidates.

The Examination Development and Testing Unit gratefully acknowledges the assistance of other state licensing programs in the development of this candidate information bulletin. Portions of this bulletin were based on candidate information bulletins of other states.

Georgia Construction Industry Licensing Board

Division of Low Voltage Contractors

Table of Contents

	Page No.
Introduction	1
1. Getting to the Examination	1
2. Veterans' Preference Points.....	1
 At the Examination	1
3. What to Bring to the Examination.....	1
4. Special Accommodations for Candidates with Disabilities	2
5. Visitors at the Examination Site.....	2
6. Conduct During the Examination	2
7. Test-taking Skills.....	3
8. Smoking Policy.....	3
9. Dressing for the Examination	3
10. Description of the Examinations	3
11. Time Limits.....	6
12. Pre-testing	6
13. Question Comments.....	6
 After the Examination	6
14. Statistical Review of Examination Performance	6
15. Difficulty Rating.....	6
16. Final Scaled Scores.....	7
17. Score Reports	7
18. Examination Regrade Process.....	7
19. Licenses	7
20. Re-examination Procedure	7
21. Sample Questions	8
22. Sample Answer Sheet.....	8

Introduction

The Division of Low Voltage Contractors of the Georgia Construction Industry Licensing Board was created by the Georgia legislature to protect the public by taking steps to ensure that licensed Low Voltage Contractors are competent in their profession. To achieve this goal, minimum standards and requirements were established by the Board for entry into the profession. Passing of a licensing examination is one of the requirements for obtaining a Low Voltage Contractors license.

Please review this bulletin carefully. It provides you with information you need about the Low Voltage examinations.

1. Getting to the Examination

An examination admission notice will be mailed two weeks prior to the examination. The notice to scheduled applicants will give the location, date, and time of the examination. We recommend that you locate the testing site and parking locations before the morning of the examination. Allow extra time on the morning of the examination to find parking and remember that most lots do charge a fee. Parking fees vary from location to location.

2. Veterans' Preference Points

Georgia law [General Provisions Volume 30, Title 43-1-9.(1)(2)(3)] provides that veterans meeting certain conditions are eligible for the addition of five or ten percentage points to their examination scores. To qualify, veterans must have served for a minimum of one year in active duty status, and must have served during a period of conflict or war for a minimum of 90 days. The law provides that you may also qualify for veterans' preference points if you served during a period of conflict or war and if you were discharged for injury or illness incurred in the line of duty and your disability is officially rated. To apply for veterans' preference points, if you have not already submitted a DD-214 form and documentation of your disability (if applicable), you may bring a copy of this information to the examination site and turn it in to the examination proctor. Please note that the copy will not be returned to you.

At the Examination

3. What to Bring to the Examination

- A. **Admission Notice** – contains time and location of examination and the classification of the examination you will be taking.
- B. **Identification** – must bear both your picture and your signature (e.g., driver's license). If you do not have such identification, you must bring a notarized photograph of yourself.
- C. **Pencils** – do not bring pens, pencils or other writing instruments to the examination. Pencils will be provided during check-in.
- D. **Calculator** – Your calculator must be a silent, non-printing, battery operated or self-powered type. It must not be programmable and should not be a device designed for the storage and retrieval of alphabetic data (such as an electronic organizer). It should not have a keypad that has all 26 letters. You may wish to bring spare batteries for your calculator.
- E. **References** – Only reference material listed on the Suggested Reference List will be allowed in the examination room.

NOTE: Candidates are not permitted to share references or equipment during the examination. All candidates must bring their own references and equipment. Reference material may be highlighted, or underlined. References may be tabbed/indexed with permanent tabs only; post-it flags are not acceptable. Reference books may not have hand written notes or additional loose papers. If any material is downloaded from the internet, it must be bound and placed in a binder.

4. Special Accommodations for Candidates with Disabilities

The Georgia Construction Industry Licensing Board wants to ensure that all qualified individuals with a disability have the opportunity to take any of the licensing examinations.

Wheelchair access is available at all established test centers. Candidates are requested to advise the Board, in writing, at the time of application, that wheelchair access is necessary.

Qualified candidates with sensory, mental or physical disabilities that would prevent them from taking the examination under standard conditions may request special accommodations. Candidates should check the appropriate space on the "Examination Scheduling Form," and contact the Board office at the address below, to obtain the "Request for Disability Accommodation Guidelines." Application materials, including information requested in the "Guidelines," must be received by the Board by the application deadline and are available from:

**Construction Industry Licensing Board
Division of Low Voltage Contractors
237 Coliseum Drive
Macon, GA 31217-3858
(478) 207-1416**

5. Visitors at the Examination Site

Visitors will not be permitted in the examination room. If you need to meet family members or other persons after the examination, you should arrange to meet in the lobby of the building in which the examination is given. Candidates will not be allowed to visit with, or exchange messages with others during the examination.

6. Conduct During the Examination

Under Board rule 121-3-.02(2), you are expected to conduct yourself in a professional manner during the examination. Any candidate engaging in conduct that subverts or attempts to subvert the examination process may be dismissed from the examination, may have scores withheld and/or declared invalid, may be disqualified from the practice of the profession, or may be subject to other Board sanctions under Board rule 121-5.

- A. You may bring and use only the reference material designated on the Reference List in the examination room.
- B. You may not bring cameras, cell-phones, tape recorders, pagers, timers, personal digital assistants (PDAs), or electronic recording or transmitting devices into the examination room. **If you do bring one of these devices, you will have to leave it outside the testing room, unattended, and the state will not assume responsibility for it. IF YOU ARE FOUND IN THE TESTING ROOM WITH ONE OF THESE, YOU WILL BE DISMISSED FROM THE EXAMINATION.**
- C. You may not take notes from the examination room.
- D. You may not remove from the examination room any examination materials.
- E. You are not to reproduce or reconstruct any portion of the licensing examination or aid others in reproducing or reconstructing the same.
- F. The examination proctors cannot answer any questions about the content of any examination questions.
- G. You may not leave the examination room except with the examination proctor's permission. If you are permitted to leave, you may not use the time to refer to reference material. If you are permitted to leave and return, you will not be granted any extra time to complete your examination.
- H. Report to the examination room at the designated time. Seating of candidates, distribution of test materials and testing instructions will begin shortly thereafter. **ANYONE WHO ARRIVES AFTER TESTING BEGINS WILL NOT BE ADMITTED.**
- I. You may be dismissed from the examination room and/or may be denied a license for irregularities including, but not necessarily limited to:
 - 1. disrupting other candidates;
 - 2. attempting to copy answers from another candidate;
 - 3. allowing your answers to be copied;
 - 4. impersonating another examination candidate;
 - 5. failing to follow the examination proctor's instructions;
 - 6. trying to copy or remove examination materials;
 - 7. trying to use unauthorized references or materials.

7. Test-taking Skills

- A. Read all instructions carefully, and be sure you understand them. Ask questions about any instructions that are unclear.
- B. Bring a watch to the examination to use in measuring your progress through the examination. Removing your watch and placing it in view on the table may save you time since a quick time check will not require major changes in body position or eye focus.
- C. Be sure to mark an answer for all questions, even the ones about which you may be unsure. There is no penalty for guessing, and your score is based upon the total number of questions you answer correctly.
- D. For each question, select the BEST answer of the options listed. More than one choice may be partially correct, but for each question there should be only one best answer.
- E. Be sure to mark your answers on the answer sheet provided. No credit will be given for any work done in your examination booklet or answers marked in your booklet.
- F. Scratch paper will not be needed. You may perform any computations or make notes in the examination booklet.
- G. Do not make stray marks on your answer sheet. You may wish to make a note in your examination booklet next to any questions you wish to review before you turn in your examination.

8. Smoking Policy

Smoking is not allowed in the examination room or connecting restrooms.

9. Dressing for the Examination

Dress comfortably. Individuals have different temperature preferences and it is not possible for us to please everyone. We often have little control over the heating and air-conditioning in the locations we use for examinations. We recommend that you bring a sweater or jacket so that you can be comfortable in different conditions.

10. Description of the Examinations

Four Low Voltage Contractors licensure examinations are offered to correspond with the four classes of Low Voltage licenses – Alarm(A), General(G), Telecommunications(T), and Unrestricted (U). All examinations consist of multiple-choice questions. Please refer to the information on the following pages for the number of questions on each examination and the content categories.

Content Categories for Low Voltage Contractors

		<u>Number of Questions</u>			
		<u>A</u>	<u>G</u>	<u>T</u>	<u>U</u>
1. Regulations, Laws, and Administrative Functions		<u>18</u>	<u>10</u>	<u>16</u>	<u>23</u>
A. <i>Comply with Laws</i>		4	2	4	4
1. Workers' compensation					
2. Unemployment insurance					
3. Employer's tax guide (circular E)					
4. Georgia Construction Industry Licensing Board (complaint procedures, function of, renewal, etc.)					
5. State sales and use tax					
6. Business license					
7. American's with Disabilities Act (ADA)					
B. <i>Comply with Regulations</i>		14	8	12	19
1. Obtain necessary low voltage permits and inspections					
2. Code of Federal Regulations, Title 29, Part 1926 (OSHA)					
3. National Fire Protection Association (NFPA)					
4. Underwriter's Laboratory (UL) or other appropriate certification					
5. National Electrical Code (NEC)					
6. Insurance: liability, property damage, auto, etc.					
7. Accident or incident reports					
2. Installation and Servicing		<u>57</u>	<u>40</u>	<u>59</u>	<u>67</u>
A. <i>Read blueprints to determine installation requirements</i>		10	3	10	10
1. Determine if equipment meets the NEC, NFPA, ADA, and local requirements					
2. Select equipment to be installed considering design specifications, customer preferences, and physical environment: power supplies, transformers, batteries, smoke/heat detectors, water flow valves, etc.					
a. commercial					
1. health care (hospital, nursing home, personal care, etc.)					
2. places of assembly (stadium, church, auditorium, etc.)					
b. industrial					
1. hazardous					
2. non-hazardous					
c. residential					
3. Select type and gauge of wire to be installed					
4. Determine and/or verify locations of devices/equipment/wiring					
5. Determine the impact of designed floor space (modular furniture, fixed walls, etc.) on installation					
6. Identify symbols on blueprint legend					
7. Identify fire wall location					
8. Identify types of circuits (series, parallel, normally open/closed, EOL, etc.)					
B. <i>Determine how distribution methods (wiring/cabling) affect building structural and installer safety</i>		10	5	16	14
1. Commercial					
2. Industrial					
a. hazardous					
b. non-hazardous					
3. Residential					

Number of Questions

	<u>A</u>	<u>G</u>	<u>T</u>	<u>U</u>
C. Cable/Wire Installation – Interior	20	16	19	20
1. Select cabling/wiring route (risers, plenums, etc.)				
2. Install conduit/tubing according to job specifications				
3. Pull cable/wire through conduit or through ceiling				
4. Size and drill holes through existing construction				
5. Fish cable/wire through existing construction				
6. Determine and place cable/wire supports at specified intervals				
7. Splice or terminate cable/wire at specified locations (equipment or device end)				
8. Label cable/wire during or after installation				
9. Repair fire-rated assemblies (walls, floors, ceilings, etc.)				
10. Install lightning and surge protection				
11. Install bonds and grounds at specified locations				
12. Observe safety considerations during installation (hard hat, safety glasses, foreign voltage, etc.)				
13. Install specified equipment: mounting devices, control panels, PBX/KSU, patch panels, etc.				
14. Test all installed devices for proper operation				
15. Evaluate installation for accepted standards of workmanship				
D. Cable/Wire Installation – Exterior	13	14	10	18
1. Select cabling/wiring route				
2. Install conduit/tubing according to job specifications				
3. Pull cable/wire through conduit, direct burial, or aerial				
4. Size and drill holes through existing construction				
5. Determine and place cable/wire supports at specified intervals				
6. Splice or terminate cable/wire at specified locations (equipment or device end)				
7. Label cable/wire during or after installation				
8. Repair fire-rated assemblies (walls, floors, ceilings, etc.)				
9. Install lightning and surge protection				
10. Install bonds and grounds at specified locations				
11. Observe safety considerations during installation (foreign voltage, hazardous gases, proper safety equipment, etc.)				
12. Test all installed devices for proper operation				
13. Evaluate installation for accepted standards of workmanship				
E. Documentation	4	2	4	5
1. Provide documentation regarding customer installation: type of device, location, wiring, owner's manual, user guide, programming record (hard copy, diskettes, tape, etc.)				
a. Commercial				
b. Residential				
c. Industrial				
Total Number of Test Questions	75	50	75	90
Additional Pre-test Questions Per Examination	<u>15</u>	<u>10</u>	<u>10</u>	<u>15</u>
Total Number of Test and Pre-test Questions	90	60	85	105

11. Time Limits

You will have four (4) hours to complete the Low Voltage Contractors licensure examinations. This limit includes time for the pre-test questions (see page 5).

12. Pre-testing

The total number of questions on the examinations will include pre-testing of new test questions. The number of questions used to compute your score is shown on page 5 (total number of test questions). The pre-test questions will not be used to compute your score, but will allow for the collection of statistical information on the questions. Pre-test questions will be either rewritten or included on future examinations based on the statistical information collected.

13. Question Comments

There will be space provided on the back of the answer sheet (a sample is provided at the end of this bulletin) for you to comment on the examination's content or on any of the individual questions. When commenting on a question, please be as specific as possible and provide supporting arguments. If you believe that a question is unclear, explain why this is so. Your comments will be used in determining which questions on the examination will be reviewed prior to grading.

After the Examination

14. Statistical Review of Examination Performance

After administration of the Low Voltage Contractors examinations, a statistical analysis of the examination and of each question is conducted. Based on the statistics and the candidates' comments, questions that might be flawed will be reviewed by the Division. After review of the questions on the examinations, the examinations are scored.

15. Difficulty Rating

The examination is developed in a manner to ensure consistency in evaluating the candidates' competency in the profession. Individual questions used on the examination are developed using a panel of licensed contractors. As each question is approved, it is assigned a difficulty rating by the panel. The difficulty rating of each question is used to determine the passing point of the examination form. In this manner, passing an examination form with more difficult questions will require a smaller number of correct answers, while passing an examination form with less difficult questions will require a larger number of correct answers. This process of determining the passing score is referred to as the modified Angoff method.

A new examination form is created for each examination administration. When a new examination is created, it is not possible to select questions with exactly the same difficulty level as all previous examinations. Accordingly, requiring candidates to answer correctly the same number of questions in order to pass different examination forms would be unfair.

Therefore, the number of answers required to pass any given examination form will vary from one form to another, based on the difficulty of the questions. If the questions selected for one examination form are more difficult, fewer questions are required to be answered correctly to pass that examination form. For example, a candidate may be required to answer 68% of the questions correctly to pass a more difficult examination form. To pass a less difficult examination form, correct answers for 72% of the questions may be required.

16. Final Scaled Scores

To record and report scores for examination forms with different passing points in a consistent manner, the minimum passing score for each examination form is converted to a final scaled score of 70. In this manner, the minimum passing score is 70 for all examination forms, regardless of the difficulty level of the individual examination form.

In the example above, candidates who correctly answer 68% of the questions on the more difficult examination would receive a final scaled score of 70. Candidates who answer more questions correctly would receive a final scaled score proportionately higher than 70. Candidates who answer fewer questions correctly would receive a final scaled score proportionately lower than 70.

The final scaled score of 70 is required for passing any examination form. By scaling the scores based on a common passing score of 70, a candidate's performance from one examination form to another is directly comparable, the relative performance of examination forms administered from one time period to another can be evaluated, and the processing of candidate scores is fairer because the difficulty level of the individual examination forms has been controlled.

17. Score Reports

Approximately six (6) weeks after the examination, score reports will be mailed. Examination scores cannot be released over the telephone, so please do not call the Board Office for this purpose. Passing candidates will receive their examination score, while failing candidates will receive their examination score and subscores in the major examination content areas. Subscores will be provided for the examination major content areas listed in this bulletin (see page 4).

18. Examination Regrade Process

Your scores are checked many times to ensure the accuracy of your test results. The optical scanner used in scoring your test is extremely accurate, and scores close to 70 are routinely handscored. Experience has shown that it is extremely unlikely that any scoring errors will occur.

However, you may request a handscoring of your answer sheet. In the unlikely event that your score changes, the new score from the handscoring will replace your previous score, whether the score increases or decreases. You must send your request in writing, within thirty (30) days of the postmark of your examination results notice to the address given below. Please indicate the date on which you took the examination and the title of the examination you wish to be handscored. You will receive notification of the handscoring results within thirty (30) days of receipt of the request. Results of the handscoring will be final. Requests for handscoring should be sent to:

Applied Measurement Professionals, Inc.
8310 Nieman Road
Lenexa, KS 66214-1579

19. Licenses

The Board Office will mail passing candidates their licenses approximately six (6) weeks after the examination date. Any questions regarding licensing should be directed to the Board Office at 237 Coliseum Drive, Macon, GA 31217-3858, (478) 207-1416.

20. Re-examination Procedure

Candidates failing the examination must retake and pass the examination in order to become licensed. A new scheduling form will be sent with the score report to failing candidates. Questions about examination scheduling may be directed to Applied Measurement Professionals, Inc., Candidate Services Department at 1-800-345-6559. A current scheduling form may be obtained from the Board Office or from the Board's website at www.sos.state.ga.us.

21. Sample Questions

The following questions are intended to help you become familiar with some of the types of questions you may encounter on the examinations. These sample questions do not represent the full range of content or difficulty levels contained in the actual examinations.

1. Which of the following type of bonds will ensure that a respondent will complete the work to the specifications for a project?
 - A. fidelity bond
 - B. grounding bond
 - *C. performance bond
 - D. payment bond

2. In a 30' x 30' frame building, which of the following types of motion detectors is **LEAST** effective?
 - A. passive infrared
 - *B. microwave
 - C. combination PIR/microwave
 - D. photo electric

3. Which of the following is necessary to ensure proper cable installation standards?
 - I. pre-cut over inspection
 - II. selection of equipment room
 - III. communication with suppliers/vendors
 - IV. job in progress inspection
 - A. IV only
 - *B. I and IV only
 - C. I, II, and III only
 - D. II, III, and IV only

* Correct Answer

22. Sample Answer Sheet

A sample answer sheet is included at the end of this bulletin.



APPLIED MEASUREMENT
PROFESSIONALS, INC.

ANSWER SHEET

Directions for Marking the Answer Sheet

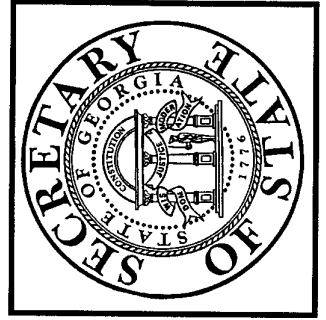
- Use a No. 2 lead pencil. Do **NOT** use ink or ball point pen.
- Make dark marks that completely fill the circle.
- Make **NO** stray marks on the answer sheet.

A NAME (Please print clearly.)

Last Name	First Name	Middle Initial
-----------	------------	----------------

[illegible]

C APPLICANT ID NUMBER												D BIRTHDAY	
												MONTH	DAY
												<input type="radio"/> Jan.	<input type="radio"/>
												<input type="radio"/> Feb.	<input type="radio"/>
												<input type="radio"/> Mar.	<input type="radio"/> 0
												<input type="radio"/> Apr.	<input type="radio"/> 1
												<input type="radio"/> May	<input type="radio"/> 2
												<input type="radio"/> June	<input checked="" type="radio"/> 3
												<input type="radio"/> July	<input type="radio"/> 4
												<input type="radio"/> Aug.	<input type="radio"/> 5
												<input type="radio"/> Sept.	<input type="radio"/> 6
												<input type="radio"/> Oct.	<input type="radio"/> 7
												<input type="radio"/> Nov.	<input type="radio"/> 8
												<input type="radio"/> Dec.	<input type="radio"/> 9

[illegible]

1	A	B	C	D	41	A	B	C	D	81	A	B	C	D	121	A	B	C	D	161	A	B	C	D
2	A	B	C	D	42	A	B	C	D	82	A	B	C	D	122	A	B	C	D	162	A	B	C	D
3	A	B	C	D	43	A	B	C	D	83	A	B	C	D	123	A	B	C	D	163	A	B	C	D
4	A	B	C	D	44	A	B	C	D	84	A	B	C	D	124	A	B	C	D	164	A	B	C	D
5	A	B	C	D	45	A	B	C	D	85	A	B	C	D	125	A	B	C	D	165	A	B	C	D
6	A	B	C	D	46	A	B	C	D	86	A	B	C	D	126	A	B	C	D	166	A	B	C	D
7	A	B	C	D	47	A	B	C	D	87	A	B	C	D	127	A	B	C	D	167	A	B	C	D
8	A	B	C	D	48	A	B	C	D	88	A	B	C	D	128	A	B	C	D	168	A	B	C	D
9	A	B	C	D	49	A	B	C	D	89	A	B	C	D	129	A	B	C	D	169	A	B	C	D
10	A	B	C	D	50	A	B	C	D	90	A	B	C	D	130	A	B	C	D	170	A	B	C	D
11	A	B	C	D	51	A	B	C	D	91	A	B	C	D	131	A	B	C	D	171	A	B	C	D
12	A	B	C	D	52	A	B	C	D	92	A	B	C	D	132	A	B	C	D	172	A	B	C	D
13	A	B	C	D	53	A	B	C	D	93	A	B	C	D	133	A	B	C	D	173	A	B	C	D
14	A	B	C	D	54	A	B	C	D	94	A	B	C	D	134	A	B	C	D	174	A	B	C	D
15	A	B	C	D	55	A	B	C	D	95	A	B	C	D	135	A	B	C	D	175	A	B	C	D
16	A	B	C	D	56	A	B	C	D	96	A	B	C	D	136	A	B	C	D	176	A	B	C	D
17	A	B	C	D	57	A	B	C	D	97	A	B	C	D	137	A	B	C	D	177	A	B	C	D
18	A	B	C	D	58	A	B	C	D	98	A	B	C	D	138	A	B	C	D	178	A	B	C	D
19	A	B	C	D	59	A	B	C	D	99	A	B	C	D	139	A	B	C	D	179	A	B	C	D
20	A	B	C	D	60	A	B	C	D	100	A	B	C	D	140	A	B	C	D	180	A	B	C	D
21	A	B	C	D	61	A	B	C	D	101	A	B	C	D	141	A	B	C	D	181	A	B	C	D
22	A	B	C	D	62	A	B	C	D	102	A	B	C	D	142	A	B	C	D	182	A	B	C	D
23	A	B	C	D	63	A	B	C	D	103	A	B	C	D	143	A	B	C	D	183	A	B	C	D
24	A	B	C	D	64	A	B	C	D	104	A	B	C	D	144	A	B	C	D	184	A	B	C	D
25	A	B	C	D	65	A	B	C	D	105	A	B	C	D	145	A	B	C	D	185	A	B	C	D
26	A	B	C	D	66	A	B	C	D	106	A	B	C	D	146	A	B	C	D	186	A	B	C	D
27	A	B	C	D	67	A	B	C	D	107	A	B	C	D	147	A	B	C	D	187	A	B	C	D
28	A	B	C	D	68	A	B	C	D	108	A	B	C	D	148	A	B	C	D	188	A	B	C	D
29	A	B	C	D	69	A	B	C	D	109	A	B	C	D	149	A	B	C	D	189	A	B	C	D

1	43	85	127	152	177
2	44	86	128	153	178
3	45	87	129	154	179
4	46	88	130	155	180
5	47	89	131	156	181
6	48	90	132	157	182
7	49	91	133	158	183
8	50	92	134	159	184
9	51	93	135	160	185
10	52	94	136	161	186
11	53	95	137	162	187
12	54	96	138	163	188
13	55	97	139	164	189
14	56	98	140	165	190
15	57	99	141	166	191
16	58	100	142	167	192
17	59	101	143	168	193
18	60	102	144	169	194
19	61	103	145	170	195
20	62	104	146	171	196
21	63	105	147	172	197
22	64	106	148	173	198
23	65	107	149	174	199
24	66	108	150	175	200
25	67	109	151	176	

TESTING CONDITIONS. Questions on testing conditions are included in the test booklet. Please indicate your response to each of the questions (A through N) below by blackening Y for Yes, or N for No.

Question # _____	Question # _____
Question # _____	Question # _____
Question # _____	Question # _____
Question # _____	Question # _____